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| 09/994,539 | 11/27/2001 | Takashi Watanabe | 56738 (70840) | 8187 |

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EXAMINER

AGGARWAL, YOGESH K

ART UNIT PAPER NUMBER

2615

DATE MAILED: 06/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|---------------------------------------|--|--|
| Office Action Summary | Application No. 09/994,539 | Applicant(s) WATANABE, TAKASHI | |
| | Examiner Yogesh K. Aggarwal | Art Unit 2615 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 February 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 November 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Response to Arguments

1. Applicant's arguments filed 02/14/2005 have been fully considered but they are not persuasive.

Examiner's response:

2. Applicant argues w.r.t claims 1 and 14 that the sampling being described in Parulski does not teach where a read pixel position selecting section would select read pixel positions such that in two directions crossing each other, a first pixel pair of horizontally-adjacent pixels and a second pixel pair of vertically adjacent pixels are provided so as to alternate with each other. At best, what Parulski depicts in few occurrences in figure 4 are sample pixels that form an L or corner shaped arrangement which is clearly is not an alternating arrangement as claimed. The Examiner respectfully disagrees. Parulski teaches in col. 6 lines 49-61 that the sub-sampling illustrated by FIG. 4 is obtained by suitably programming the microprocessor controller 82 to instruct the timing generator 80 to produce address and control signals at the proper intervals so as to store only the values of the circled pixels of FIG. 4 into frame memory 62. The values from the non-circled pixels are not stored. Therefore only circled pixels are stored and read from the image pick up device and stored into the frame memory. Hence Parulski teaches a read pixel position selecting section (82) that would select read pixel positions (circled pixels) such that in two directions crossing each other (vertical and horizontal directions cross each other), a first pixel pair of horizontally-adjacent pixels (in figure 7, the circled green and red pixels in the first row and the first and second column are a pixel pair of horizontally-adjacent pixels) and a second pixel pair of vertically adjacent pixels (in figure 7, the circled green and blue pixels in the first

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and second row and fifth column are a pixel pair of vertically adjacent pixels). These first and second pixel pairs are alternating with each other as shown in figure 7.

3. As per the amended claim limitation “wherein the pixels of the first pixel pair and the pixels of the second pixel pair are different”. As explained the first pixel pair of horizontally-adjacent pixels (in figure 7, the circled green and red pixels in the first row and the first and second column are a pixel pair of horizontally-adjacent pixels) and a second pixel pair of vertically adjacent pixels (in figure 7, the circled green and blue pixels in the first and second row and fifth column are a pixel pair of vertically adjacent pixels) have different pixels in each pair.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 2, 4-8, 13, 14, 15, 17-21, 26 rejected under 35 U.S.C. 102(b) as being anticipated by Parulski et al. (US Patent # 5,493,335).

[Claims 1, 2 and 4]

Parulski et al. teaches a color solid-state imaging apparatus, comprising a plurality of pixel devices provided in a plane, a Bayer array color filter which includes first through third color filter segments and which is provided over the plurality of pixel devices, each of the first through third color filter segments corresponding to a respective one of the plurality of pixel devices (See figure 4) and a read pixel position selecting section (figure 1, element 82) for selecting read pixel

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positions (circled pixels) such that in two directions crossing each other (vertical and horizontal directions cross each other), which are horizontal and vertical as shown in figure 4(col. 6 lines 49-53), a first pixel pair of horizontally-adjacent pixels (in figure 7, the circled green and red pixels in the first row and the first and second column are a pixel pair of horizontally-adjacent pixels) corresponding to a first color filter segment (green) and a second color filter segment (red) and a second pixel pair of vertically-adjacent pixels (in figure 7, the circled green and blue pixels in the first and second row and fifth column are a pixel pair of vertically adjacent pixels) corresponding to a first color filter segment (green) and a third color filter segment (blue) are provided so as to alternate with each other, and there are (N-1) pairs of unselected pixels (N is a positive integer) between the alternate first and second pixel pairs (col. 6 lines 4-21, figure 4).

The newly added limitation “wherein the pixels of the first pixel pair and the pixels of the second pixel pair are different” has been read as the first pixel pair of horizontally-adjacent pixels (in figure 7, the circled green and red pixels in the first row and the first and second column are a pixel pair of horizontally-adjacent pixels) and a second pixel pair of vertically adjacent pixels (in figure 7, the circled green and blue pixels in the first and second row and fifth column are a pixel pair of vertically adjacent pixels) have different pixels in each pair.

[Claims 14, 15 and 17]

Parulski et al. teaches a color solid-state imaging apparatus (figure 7), comprising a plurality of pixel devices arranged in a matrix, a color filter which includes first through third color filter segments and which is provided over the plurality of pixel devices, the first color filter segments (green) having a first spectral characteristic, the second color filter (red) segments having a second spectral characteristic, and the third color filter segments (blue) having a third spectral

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characteristic, wherein the first color filter segments are provided over every other pixel device in horizontal and vertical directions, and the second and third color filter segments are line-sequentially provided over the remaining pixel devices, in which the first color filter segments are not provided, in separate rows in an alternating manner (See figure 7), and a read pixel position selecting section (figure 1, element 82) for selecting read pixel positions such that the plurality of pixel devices are divided into pixel units in such a manner that each pixel unit consists of four pixel devices of the plurality of pixel devices arranged so as to have two horizontally-adjacent pixel devices (Horizontally adjacent Green and red pixels in first row) and two vertically-adjacent pixel devices (Vertically adjacent Green and blue pixels corresponding to fifth column and first two rows), a first pixel unit selecting two horizontally-adjacent pixel devices respectively corresponding to a first color filter segment (G11) and a second color filter segment (R12), and a second pixel unit selecting two vertically-adjacent pixel devices respectively corresponding to a first color filter segment (G15) and a third color filter segment (B25) (wherein 11, 12, 15 and 25 correspond to row and column number respectively), wherein, in two directions crossing each other which are horizontal and vertical, the first pixel unit and the second pixel unit alternate with each other, and there are (N-1) units of unselected pixels (N is a positive integer) between the alternate first and second units (col. 7 lines 18-31, figure 7). The newly added limitation “wherein the pixels of the first pixel pair and the pixels of the second pixel pair are different” has been read as the first pixel pair of horizontally-adjacent pixels (in figure 7, the circled green and red pixels in the first row and the first and second column are a pixel pair of horizontally-adjacent pixels) and a second pixel pair of vertically adjacent pixels (in

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figure 7, the circled green and blue pixels in the first and second row and fifth column are a pixel pair of vertically adjacent pixels) have different pixels in each pair.

[Claims 5, 6, 18, 19]

Re these claims, by comparing read selecting positions as recited in claims 1 and 14 of the applicants with figures 4 and 7 of Parulski et al. it is apparent that since the same reading pattern for RGB pixels takes place, the same mathematical relationship exists between the two.

Therefore it is considered that if frame rate is the same, the pixel-reading period is increased to $2N^2$ times or alternatively if period of time required for reading one pixel is the same the frame rate is increased $2N^2$ times in comparison with a case where data corresponding to all of the pixels is read as recited in these claims.

[Claims 7, 20]

Parulski et al. teaches that the sub-sampling illustrated by figure 4 is obtained by suitably programming the microprocessor 82 to instruct the timing generator 80 to instruct to produce address and control signals at the proper intervals so as to read and then store values of only circled pixels after color processing is done by DSP 64 (col. 6 lines 49-53, col. 6 lines 4-21, figure 4) which can read on the recited limitation of a series of horizontal reading operations being performed so as to read data corresponding to selected pixels row-by-row and then perform color signal processing corresponding to the selected pixels.

[Claims 8, 9, 20, 21]

Parulski et al. teaches that the sub-sampling illustrated by figure 4 is obtained by suitably programming the microprocessor 82 to instruct the timing generator 80 to instruct to produce address and control signals at the proper intervals so as to read and then store values of only

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circled pixels after color processing is done by DSP 64 (col. 6 lines 49-53, col. 6 lines 4-21, figure 4) which can read on the recited limitation of a series of horizontal reading operations being performed so as to read data corresponding to selected pixels row-by-row or upper and lower pixels alternately selected in two adjacent rows and then perform color signal processing corresponding to the selected pixels.

[Claims 13, 26]

Figure 1 in Parulski discloses an image information apparatus for imaging an object using the color solid-state imaging device of claims 1 and 14.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 3, 9-12, 16, 22-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parulski et al. (US Patent # 5,493,335) in view of Campbell (US Patent # 6,657,755).

[Claims 3, 16]

Parulski fails to teach, "wherein the two directions crossing each other are two different diagonal directions". However Campbell discloses reading the RGB pixels in two different diagonal directions (col. 1 lines 51-58, figure 1B). Therefore taking the combined teachings of Parulski and Campbell, it would have been obvious to one skilled in the art at the time of the invention to have been motivated to read the RGB pixels in a manner shown by Parulski (figures 4 and 7) and in a diagonal direction as taught by Campbell in order to have a picture with better resolution.

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The benefit of doing so would be so that the resolution can increase along certain axes by a factor of $\sqrt{2}$ and improved sensitivity as taught by Campbell (col. 2 lines 18-20, 38-39).

[Claims 9, 10, 22, 23]

Re these claims, by comparing read selecting positions as recited in claims 1 and 14 of the applicants with figures 4 and 7 of Parulski et al. it is apparent that since the same reading pattern for RGB pixels takes place, the same mathematical relationship exists between the two.

Therefore it is considered that if frame rate is the same, the pixel-reading period is increased to $4N^2$ times or alternatively if period of time required for reading one pixel is the same the frame rate is increased to $4N^2$ times in comparison with a case where data corresponding to all of the pixels is read as recited in these claims.

[Claims 11, 12, 24, 25]

Parulski et al. teaches that the sub-sampling illustrated by figure 7 is obtained by suitably programming the microprocessor 82 to instruct the timing generator 80 to instruct to produce address and control signals at the proper intervals so as to read and then store values of only circled pixels after color processing is done by DSP 64 (col. 7 lines 18-31, figure 7) which can read on the recited limitation of a series of horizontal reading operations being performed so as to read data corresponding to selected pixels row-by-row or upper and lower pixels alternately selected in two adjacent rows and then perform color signal processing corresponding to the selected pixels in three or four horizontal reading operations.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yogesh K. Aggarwal whose telephone number is (571) 272-7360. The examiner can normally be reached on M-F 9:00AM-5:30PM.

9. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Ometz can be reached on (571)-272-7593. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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10. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

YKA

June 3, 2005



DAVID L. OMETZ
PRIMARY EXAMINER